line 25, below the caption "TABLE 2" kindly delete the word "Conductivity" and insert in lieu thereof --Conductance--;

line 26, kindly delete the heading "Conductivity (micromhos) and insert in lieu thereof --Conductance (micromhos)--.

IN THE CLAIMS:

Cancel claims 1-26 and substitute therefor the following new claims:

A3

--27. An integral air impermeable composite membrane comprising:

a polymeric support having a microstructure of micropores, said microstructure defining a porosity in the range of about 70% to 98% within said polymeric support,

at least one ion exchange resin filling said microstructure such that said composite membrane is air impermeable, said composite membrane having an ionic conductance of at least 8.5 mhos/cm^2 and a thickness of atmost 0.8 mils.

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28. The composite membrane of claim 27, wherein said polymeric support is a polyolefin.

29 ~~28~~. The composite membrane of claim 27, wherein said polymeric support is a fluorinated polymer.

30. ~~29~~. The composite membrane of claim 27, wherein said polymeric support is a chlorinated polymer.

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31 ~~30~~. The composite membrane of claim 29, wherein said fluorinated polymer is polytetrafluoroethylene.

32. ~~31~~. The composite membrane of claim 31, wherein said polytetra-fluoroethylene is expanded polytetrafluoroethylene.

33 ~~32~~. The composite membrane of claim 27, wherein said polymeric support is a polyamide.

34 ~~33~~. The composite membrane of claim 27, wherein said polymeric support is a polycarbonate.

35. ~~34~~. The composite membrane of claim 28, wherein said microstructure is formed from nodes interconnected with fibrils.

36 ~~35~~. The composite membrane of claim 32, wherein said microstructure is formed from nodes interconnected with fibrils.

37. ~~36~~. The composite of claim 27, wherein said composite membrane has a thickness in the range of between 0.06 and 0.8 mils.

38. ~~37~~. The composite of claim 27, wherein said composite membrane has a thickness in the range of between about 0.5 and 0.8 mils.

39. ~~38~~. The composite membrane of claim 27, wherein said composite membrane has a thickness of at most 0.5 mils.

40. ~~39~~. The composite membrane of claim 27, wherein said at least one ion exchange resin comprises a mixture of ion exchange resins.

41 ~~40~~. The composite membrane of claim 27, wherein said at least one ion exchange resin comprises a perfluorinated sulfonic acid resin.

A3 cont'd

42 ~~41~~. The composite membrane of claim 27, wherein said at least one ion exchange resin comprises a perfluorinated carboxylic acid resin.

43 ~~42~~. The composite membrane of claim 27, wherein said at least one ion exchange resin comprises a polyvinyl alcohol.

44 ~~43~~. The composite membrane of claim 27, wherein said at least one ion exchange resin comprises a divinyl benzene resin.

45 ~~44~~. The composite membrane of claim 27, wherein said at least one ion exchange resin comprises a styrene-based polymer.

~~45~~ 46. The composite membrane of claim 27, wherein said at least one ion exchange resin further comprises metal salts with or without a polymer.

~~46~~ 47. The composite membrane of claim 40, wherein said mixture of ion exchange resins includes at least two of a perfluorinated sulfonic acid resin, a perfluorinated carboxylic acid resin, a polyvinyl alcohol resin, a divinyl benzene resin or styrene-based polymer.

~~47~~ 48. The composite membrane of claim 27, wherein said at least one ion exchange resin is a perfluorosulfonic acid/tetrafluoroethylene copolymer resin.

~~48~~ 49. The composite membrane of claim 27, further comprising a reinforcement backing bonded to a side thereof.

~~49~~ 50. An integral substantially air occlusive integral composite membrane having a polymeric support with a microstructure of pores, said microstructure filled with an ion exchange resin said composite having an ionic conductance of at least 8.5 mhos/cm^2 prepared by,

(a) providing a polymeric support having a microstructure of micropores;

(b) sequentially applying an ion exchange resin solution to each major surface of said polymeric support; and

(c) repeating step (b) until said micropores are sufficiently filled with ion exchange resin to form an air occlusive integral composite membrane.

~~50~~ 51. The composite membrane of claim 50, wherein said step (b) further includes,

(b1) drying said support after each application of ion exchange resin solution to remove solvent from said solution.

~~51~~ 52. The composite membrane of claim 50, wherein said step (b) includes at least two successive applications of said ion exchange resin solution.

~~52~~ 53. The composite membrane of claim 50, wherein said step (b) includes at least three successive applications of said ion exchange resin solution.

~~53~~ 54. The composite membrane of claim 50, wherein said step (b) includes at least two successive applications of said ion exchange resin solution and an intervening drying step.

~~54~~ 55. The composite membrane of claim 50, wherein said step (b) includes at least three successive applications of said ion exchange resin solution and an intervening drying steps.

~~55~~ 56. The composite membrane of claim 50, wherein said support comprises a polyolefin.

~~56~~ 57. The composite membrane of claim 50, wherein said support comprises a fluorinated polymer.

~~57~~ 58. The composite membrane of claim 50, wherein said support comprises a chlorinated polymer.

~~58~~ 59. The composite membrane of claim 50, wherein said fluorinated polymer is polytetrafluoroethylene.

~~59~~ 60. The composite membrane of claim 59, wherein said polytetra-fluoroethylene is expanded polytetrafluoroethylene.

~~60~~ 61. The composite membrane of claim 50, ~~wherein said~~ support comprises a polyamide.

~~61~~ 62. The composite membrane of claim 50, wherein said support comprises a polycarbonate.

~~62~~ 63. The composite membrane of claim 50, where said microstructure is formed nodes interconnected with fibrils.

~~63~~ 64. The composite membrane of claim 50, wherein said composite membrane has a thickness in the range between 0.06 and 0.8 mils.

65 ~~64~~. The composite membrane of claim 55, wherein said composite membrane has a thickness in the range of between about 0.5 and at most 0.8 mils.

66 ~~65~~. The composite membrane of claim 55, wherein said composite membrane has a thickness of at most about 0.5 mils.

67 ~~66~~. The composite membrane of claim 50, wherein said ion exchange resin is a mixture of resins.

B3 cont'd

68 ~~67~~. The composite membrane of claim 50, wherein said ion exchange resin is a perfluorinated sulfonic acid resin.

69 ~~68~~. The composite membrane of claim 51, wherein said drying is conducted at about room temperature.

70 ~~69~~. The composite membrane of claim 55, wherein said ion exchange resin solution is applied in the presence of a surfactant.

71 ~~70~~. The composite membrane of claim 50, wherein said ion exchange resin solution is prepared from an ion exchange resin and a solvent.

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~~71~~ 72. A method of preparing a substantially occlusive integral composite comprising:

(a) providing a polymeric support having a microstructure of micropores;

(b) sequentially applying an ion exchange resin solution to each major surface of said polymeric support; and

(c) repeating step (b) until said micropores are sufficiently filled with ion exchange resin to form an air occlusive integral composite membrane having an ionic conductance of at least 8.5 mhos/cm^2.

~~72~~ 73. The method of claim 72, wherein said step (b) includes at least two successive applications of said ion exchange resin solution.

~~73~~ 74. The method of claim 72, wherein said step (b) includes at least three successive applications of said ion exchange resin solution.

~~74~~ 75. The method of claim 72, wherein said step (b) includes at least two successive applications of said ion exchange resin solution and an intervening drying step.

~~75~~ 76. The method of claim 72, wherein said step (b) includes at least three successive applications of said ion exchange resin solution and intervening drying steps.

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76. The method of claim 72, wherein said providing step (a) comprise providing as said polymeric support a polyolefin support.

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77. The method of claim 72, wherein said providing step (a) comprises providing as said polymeric support a fluorinated polymer support.

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78. The method of claim 72, wherein said providing step (a) comprises providing as said polymeric support a chlorinated polymer support.

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79. The method of claim 72, wherein said fluorinated polymer is polytetrafluoroethylene.

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80. The method of claim 80, wherein said ~~polytetra~~fluoroethylene is expanded polytetrafluoroethylene.

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81. The method of claim 72, wherein said providing step (a) comprises providing as said polymeric support a polyamide.

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82. The method of claim 72, wherein said providing step (a) comprises providing as said polymeric support a polycarbonate support.

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83. The method of claim 80, where said microstructure is formed nodes interconnected with fibrils.

~~84~~ 85. The method of claim 80, wherein said composite membrane has a thickness within the range of 0.06 to 0.8 mils.

~~85~~ 86. The method of claim 80, wherein said composite membrane has a thickness within the range of 0.5 to 0.8 mils.

~~86~~ 87. The method of claim 80, wherein said composite membrane has a thickness of at most 0.5 mils.

~~87~~ 88. The method of claim 80, wherein said ion exchange resin is a mixture of resins.

~~88~~ 89. The method of claim 80, wherein said ion exchange resin is a perfluorinated sulfonic acid resin.

~~89~~ 90. The method of claim 83, wherein said at least three successive applications of said ion exchange solution include alternate applications of said resin solution to a first side of said support and then to a second side of said support.

~~91~~ 91. A fuel cell including an ultra-thin, air impermeable integral composite membrane;

said composite membrane comprising:

a polymeric support having a microstructure of micropores, said microstructure defining a porosity in the range of about 70% to 95% within said polymeric support,

at least one ion exchange resin filling said microstructure such that said composite membrane is air impermeable, said composite membrane having thickness of at most 0.8 mils.

92. The fuel cell of claim 91, wherein said polymeric support is a fluorinated polymer.

93. The fuel cell of claim 92, wherein said fluorinated polymer is polytetrafluoroethylene.

94. The fuel cell of claim 91, wherein said microstructure is formed from nodes interconnected with fibrils.

95. The fuel cell of claim 91, wherein said composite membrane has a thickness in the range of between 0.06 and 0.8 mils.

96. The fuel cell of claim 91, wherein said composite membrane has a thickness of at most 0.5 mils.

97. The fuel cell of claim 91, wherein said at least one ion exchange resin comprises a mixture of ion exchange resins.